

# **Bruneau/Grand View Ground Water Management Plan**

**DRAFT**

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# Bruneau/Grand View Ground Water Management Plan

## PRELIMINARY DRAFT

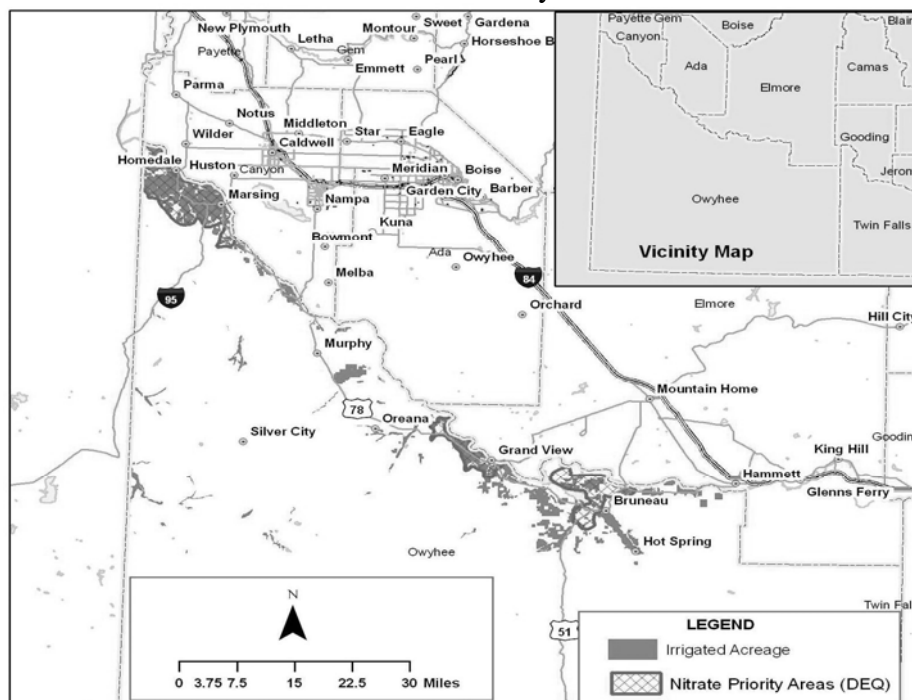
### Introduction

Nitrate is one of the most widespread ground water contaminants in Idaho. Nitrate is a form of nitrogen, an element whose compounds are vital components of foods and fertilizers. It is an essential nutrient for plant growth. Nitrate comes from a variety of sources, such as plants and other organic matter that return nitrate to the soil as they decompose. Septic sewer systems, waste from animal feedlots, and nitrogen-based fertilizers also can discharge nitrates to the environment.

As part of the Idaho Department of Environmental Quality (DEQ) goal of restoring nitrate-degraded ground water, DEQ has developed a list of 25 Nitrate Priority Areas. The area surrounding Grand View ranks sixth on the list and an area surrounding Bruneau ranks 14th. (Figure 1) This ranking is used to prioritize the development and implementation of strategies to help reduce nitrate contamination in ground water from land-use activities.

The strategies identified for the Bruneau and Grand View areas are identified in this plan and were developed through a series of meetings held from October to December 2006 in Grand View, Idaho. The strategies focus on prevention, protection, and remediation measures to maintain or improve water quality or prevent additional problems. Specific action items are also described.

Figure 1. Bruneau and Grand View Nitrate Priority Areas



## **Background**

High levels of nitrate in drinking water are associated with adverse health effects. The U.S. Environmental Protection Agency has established a federal drinking water standard of 10 milligrams of nitrate per liter of water (10 mg/L). The Idaho ground water quality standard is also 10 mg/L.

Those at risk of exposure include people who rely on private wells for their drinking water supply. Private well owners are not required to test their water and may not be aware that a problem exists. Public water systems are subject to regular testing by law and nitrate levels must be below the federal health based standards.

Children under the age of six months are more vulnerable to nitrate than adults and older children. Short-term consumption of water with nitrate levels above the drinking water standard can cause a severe health effect in infants called methemoglobinemia, or blue baby syndrome. Other potentially vulnerable populations include pregnant women, adults with reduced stomach acidity, adults who lack a hereditary enzyme needed to combat effects of nitrate in body, and dialysis patients. Healthy adults and older children are largely unaffected and quickly excrete nitrate.

Nitrate is soluble in water and can easily pass through soil to the groundwater, which is the major source of drinking water in the area. Nitrate can persist in ground water for decades and accumulate to high levels as more nitrogen is applied to the land surface every year. Application of nitrogen, in the form of commercial fertilizer and animal waste, and the contribution of excess nitrate from legume crop plow-down, can result in excessively high levels in the soil, ground water and drinking water. Shallow wells, wells in sandy soil, or wells that are improperly constructed or maintained are more likely to have nitrate contamination than deeper wells with protective casing and an effective well seal.

## **Goal**

The goal of this plan is to implement Best management Practices (BMPs) to reduce nitrite/nitrate loading of the groundwater aquifer; and to implement a homeowner well testing program. The well testing program will aid in reducing the health risks associated with high nitrite/nitrate in drinking water wells. It will also serve to educate the public in water use, consumption and conservation.

## **Strategies**

General strategies for protecting public health and reducing nitrate contributions to ground water include the following:

- Protect wellheads by providing information to private well owners about setbacks for activities with the potential to contribute contaminants to ground water (e.g.

septic systems; fertilizer storage, handling, and cleanup; livestock facilities; manure storage and silos)

- Encourage private wells owners to regularly test their well water.
- Reduce nitrate contributions from septic systems by promoting septic system maintenance.
- Control runoff and infiltration from livestock facilities by providing education, training and incentives to producers to control animal waste and by enforcing existing regulations.
- Encourage private land owners to properly store and apply animal waste at agronomic rates through education, training and incentives.
- Encourage consideration of all nitrogen sources in determining proper nitrogen-based fertilizer application to crops and recommend that all applicators soil test their fields. Sources of nitrogen include legume crop plow-down, applied organic material such as manure, residual nitrate in the soil, and nitrogen in irrigation water.

## **Plan Evaluation**

The primary goal of this plan is to reduce the contamination of nitrate in the aquifer so that the area is no longer on the statewide nitrate priority list. Due to the slow nature of ground water movement, it is not anticipated that quantitative reductions in nitrate levels will occur during the early implementation of the plan. Therefore, qualitative measures will be used to evaluate the progress and success of the plan in the short term (3 – 5 years). Once the plan is in place and is being implemented, the following activities will occur to evaluate the progress made in reducing nitrate contamination of the ground water.

- The agencies will meet annually to review implementation activities that have occurred and evaluate available monitoring results.
- The agencies will evaluate Plan effectiveness and modify as needed.

A compilation of findings from federal, state, and local agencies will be made each year. The IDEQ, with the support of the Committee, will be the lead entity to compile and provide this information. The first review would be scheduled for 2008.

The qualitative evaluation will assess whether the appropriate institutions promoted the plan recommendations, and will include the documentation of activities, practices and alternatives that have been adopted to reduce nitrate loading to the ground water. This evaluation will also consider whether the protection strategies are still being promoted and what percentage of the citizens, businesses, and other organizations are participating in the plan.

Periodically a quantitative evaluation will be performed on a longer interval to document the trend of nitrate levels since implementation of the plan. The ISDA (Ground Water Program) and IDWR (Statewide Ambient Ground Water Quality Monitoring Program) will continue to sample for nitrate on a regular basis. The IDEQ will assist with or will conduct follow-up activities that may include monitoring in response to detections of concern in public water systems or from other agencies. The determination of the success of this management plan will depend on the results of ongoing trend analyses, based on statistical analysis of monitoring results from the state monitoring networks. These activities will be a joint effort between IDEQ, ISDA, SWDH, IDWR and this Committee.

At each step, the Committee and governmental agencies will need to determine whether this management plan is addressing the ground water contamination concerns adequately or whether modifications need to be made to the plan to better enable success.

## Action Items

Specific action items are described in the following table. Also identified are the responsible agency and the timeframe.

Action Items	Agency	Timeframe
<b>Septic Systems</b> <ul style="list-style-type: none"> <li>Provide information about septic system maintenance at public locations in Bruneau and Grand View.</li> </ul>	Southwest District Health	2007 → ongoing
<b>Public Health</b> <ul style="list-style-type: none"> <li>Provide information about the health affects of nitrate at public locations in Bruneau and Grand View.</li> <li>Provide for testing of private wells and laboratory analysis for nitrate through Bruneau Soil Conservation District, as part of a '319 BMP implementation project. This will allow homeowners to recognize health risks associated with their drinking water. Wells with high levels of nitrates can be identified, replaced, repaired or abandoned. The results from the well testing program will serve as an indicator of the effectiveness of the BMPs implemented in the surrounding areas.</li> <li>Promote regular testing of private wells and provide information about analytical labs.</li> <li>Promote use of Home*A*Syst as a tool to assess and change farmstead activities that have the potential to contaminate drinking water wells.</li> </ul>	Southwest District Health DEQ, SCD, ISDA, SCC  Southwest District Health IASCD, SCC, ISDA	2007 → ongoing  2008  2007 → ongoing 2007 → ongoing
<b>Irrigated Agriculture</b> <ul style="list-style-type: none"> <li>Soil Testing and Nitrogen Application – Obtain funding for ground water protection project that includes soil testing and implementation of University of Idaho guidelines for nitrogen application (See Ashton Groundwater Protection Project for model.) Provide information on and encourage use of stabilized nitrogen formulations that minimize nitrogen losses to volatilization and deep</li> </ul>	SCC, SCD, ISDA	2007

<p>percolation.</p> <ul style="list-style-type: none"> <li>▪ Irrigation Water Management – Continue to conduct irrigation workshops. Make soil moisture monitoring equipment available to producers interested in optimizing irrigation applications. Encourage sprinkler irrigators to take advantage of Idaho Power Energy Efficiency in Irrigation program.</li> <li>▪ Crop Rotation Demonstration project – Sample soils of fields rotated out of legumes (alfalfa, beans) to provide information on soil nitrogen contribution from legumes. Follow Carter et al recommendations for crop rotation following plow down of legumes (follow alfalfa with corn to capture nitrogen released by the alfalfa. References available.)</li> <li>▪ Conduct Nutrient Management Planning with irrigated agriculture producers using the Idaho One Plan. Encourage nutrient management planning for commercial fertilizer applications as well as manure applications.</li> </ul>	<p>UI Cooperative Extension Service, ISDA, SCC, SCD</p> <p>SCD, NRCS, SCC, ISDA</p>	<p>2007 → ongoing</p> <p>2008 → ongoing</p> <p>2007 → ongoing</p>
<p>Manure Storage and Application</p> <ul style="list-style-type: none"> <li>▪ Seek legislation regarding development of Nutrient Management Plans for control of third party application of manure. Recommend senior DEQ management approach governor's office and legislature to prepare legislation.</li> <li>▪ Nutrient Management Planning for third party applicators – Provide technical assistance in identifying land owners that receive manure and conduct nutrient management planning with them.</li> <li>▪ Review research on manure stockpiling and educate public on findings and encourage voluntary BMP efforts to prevent animal waste from being stockpiled.</li> <li>▪ Prepare '319 grant to develop voluntary Nutrient Management Plans for 3<sup>rd</sup> party manure applications of manure imported into the priority area. Design and construct waste storage facilities with roof runoff to temporarily store wastes.</li> </ul>	<p>State Legislature</p> <p>SCD, NRCS, ISDA, SCD</p> <p>ISDA, SCC</p> <p>ISDA, SCC</p>	<p>2008</p> <p>2007 → ongoing</p> <p>2007 → ongoing</p> <p>2007</p>
<p>Monitoring</p> <ul style="list-style-type: none"> <li>▪ Reevaluate and adjust boundaries of priority areas.</li> <li>▪ Conduct additional ground water monitoring to better characterize nitrate contamination, determine nitrate concentration trends, identify the vertical extent</li> </ul>	<p>DEQ ISDA, DEQ, IDWR</p>	<p>2007 2007-2012</p>

<p>of contamination, and identify the presence of nitrate contamination outside of the priority area boundaries.</p> <ul style="list-style-type: none"> <li>▪ Conduct soil testing in areas where animal waste is stockpiled to determine nitrate contributions to ground water. Conduct soil testing for land where commercial fertilizer is applied.</li> <li>▪ Check and certify all agricultural BMPs to ensure that installations are completed and meet NRCS standards and specifications.</li> </ul>	<p>DEQ, ISDA, SCC, NRCS</p> <p>ISDA, SCC, NRCS</p>	<p>2008-2009</p> <p>Ongoing</p>
<p>General Information and Education</p> <ul style="list-style-type: none"> <li>▪ Provide copies of final plan to local decision makers, including Owyhee County Commissioners, Grand View City Council members, the Bruneau Soil Conservation District board members, and local newspapers and newsletters.</li> <li>▪ Provide copies of the plan to the public, upon request.</li> </ul>	<p>DEQ</p> <p>DEQ</p>	<p>2007</p> <p>Ongoing</p>
<p>State-wide Activities</p> <ul style="list-style-type: none"> <li>▪ Request that University of Idaho fertilizer application guides be reviewed and updated, as needed. (Finding a funding source for this element is the key. A separate ' 319 grant is needed to do this work for this and other priority areas.)</li> </ul>	<p>University of Idaho</p>	<p>2007 request Updates thereafter</p>